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ABSTRACT

Text, illustrations, and exercises are utilized in this set of four learning modules designed to instruct nursing students in techniques and equipment utilized for intramuscular injections. The first module, "Equipment for Intramuscular Injections" by Ellie Dunkleman, presents guidelines for selecting needles of the proper length and gauge according to the type of solution to be injected and the area of the body chosen as the injection site. The second module, "Preparation of an Intramuscular Injection from a Drug in Powder Form" by Eva M. Meyer, teaches the student to choose the proper form of medication for an intramuscular injection, select appropriate needles, and liquify powdered medication using a sterile saline solution. The third module, "Intramuscular Injection Technique: Gluteal Area" by Marcia McCormick, details the proper method of injecting a measured amount of medication into the gluteal area of a simulated hip. The fourth module, "Injection of Insulin by Kathleen Mitzen, identifies the parts of the body used as insulin injection sites and describes a method of preparing the skin for injection. The modules describe and illustrate procedures, provide sequential reinforcement exercises, and conclude with post-tests and accompanying answer keys. The time required to complete the modules ranges from 20 to 30 minutes. (JP)

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HEALTH INSTRUCTION PACKAGES

INJECTIONS

Modules prepared by:

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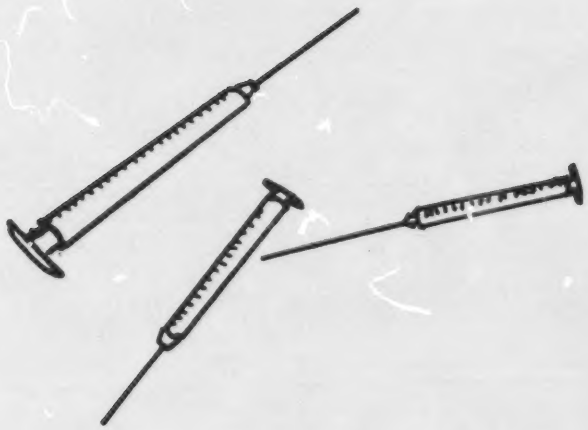
EQUIPMENT FOR INTRAMUSCULAR INJECTIONS

by

Ellie Dunkleman



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TITLE OF PACKAGE:	Equipment for intramuscular Injection
AUTHOR:	Ellie Dunkleman
INSTITUTION:	De Anza College
INTENDED STUDENTS"	Nursing
EST'MATED WORKING TIME:	20-30 Minutes
MATERIALS NEEDED:	3cc syringe;Alcohol sponges; Solutions: 1 aqueous, 1 aqueous suspension; 1 oily, 1 oily suspension; Vials; Ampules. Needles: 23, 1" needle; 22, 1 1/2" needle; 20, 1" needle; 19, 1 1/2" needle; 25, 5/8" needle. Optional: Pharmacology in Nursing, 13 Ed., Betty S. Bergersen(Mosby); Fundamentals of Nursing, 5th Ed., Elinor V. Fuerst, Lee Verre Wolff, Marlene H. Weitzel (Lippincott).

FIELD TEST COPY

NOTE: Effective use of this learning unit requires that materials listed above are available to student.

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INTRODUCTION

1. Prerequisites: You need to do this first!

   A. Read pp. 62-67 in Pharmacology in Nursing, 13th Ed., Betty S. Bergersen (Mosby); and pp. 432-434 in Fundamentals of Nursing, 5th Ed., Elinor V. Fuerst, Lee Verne Wolff, and Marlene H. Weitzel (Lippincott).

   B. Practice aspirating from an ampule and closed vial with a 3 cc syringe and any size needle. You should be able to fill the syringe to the desired volume within one minute from an ampule and vial.

2. Take this unit and be calm and cool with your first assignment in the hospital. You will learn to select the proper equipment for a given solution to be administered in a specific site for a given patient.

OBJECTIVES OF UNIT

Overall Objective

Prepare an intramuscular injection using the correct needle, gauge and length, from different solutions for the four areas where I.M.'s are administered.

Sub-Objectives

1. Recall the different gauge needles.
2. Recall the different lengths of needles.
3. Recall appropriate gauge for solution viscosity.
4. Recall appropriate needle length for the deltoid muscle.
5. Recall appropriate needle length for the vastus lateralis.
6. Recall appropriate needle length for the dorsogluteal and ventrogluteal areas.

PRACTICE EXERCISE #1

Input

A drug may be given intramuscularly in an aqueous solution, an aqueous suspension, or a solution or suspension of oil. Look at the prepared medication bottles. Notice the difference in viscosity.

The usual gauge of needles is 19 to 23, the larger the number, the finer the needle. Examine the needles and recognize that the lower gauges are heavier needles. The thicker solutions need a large diameter needle. A 19 or 20 gauge needle would be appropriate for a very viscous or oily solution. A 22 or 23 gauge needle would be most appropriate for an aqueous solution.

Practice Question #1

1) Which gauge needle would be correct for the oily solution?
2) Which gauge needle would be correct for the aqueous solution?

Proceed to the next practice session.

Feedback for Question #1

1) The 19 or 20 gauge needle would be most appropriate.
2) The 22 or 23 gauge needle.

PRACTICE EXERCISE #2

Input

Needles for intramuscular injections must be long enough to avoid depositing the drug into subcutaneous or fatty tissue. Needles from 1 to 3 inches in length may be used. Depth of insertion depends upon the amount of subcutaneous tissue and will vary with the weight of the patient. Compare the different lengths of needles:

Base of needle:

Gauge:	23	22	20	19
Length:	1"	1 1/2"	1"	1 1/2"

The length of needle depends on the site or muscle to be used for injection. The needle length for the deltoid and vastus lateralis may be 1" to 1 1/2" in length with 1" preferred for the average adult. Look at the diagrams. Note the proximity of nerves and blood vessels and thickness of these muscles. Pictures on the next page for review if needed.

Practice Question 2A

Which needle length would be correct for the average adult in the deltoid area?

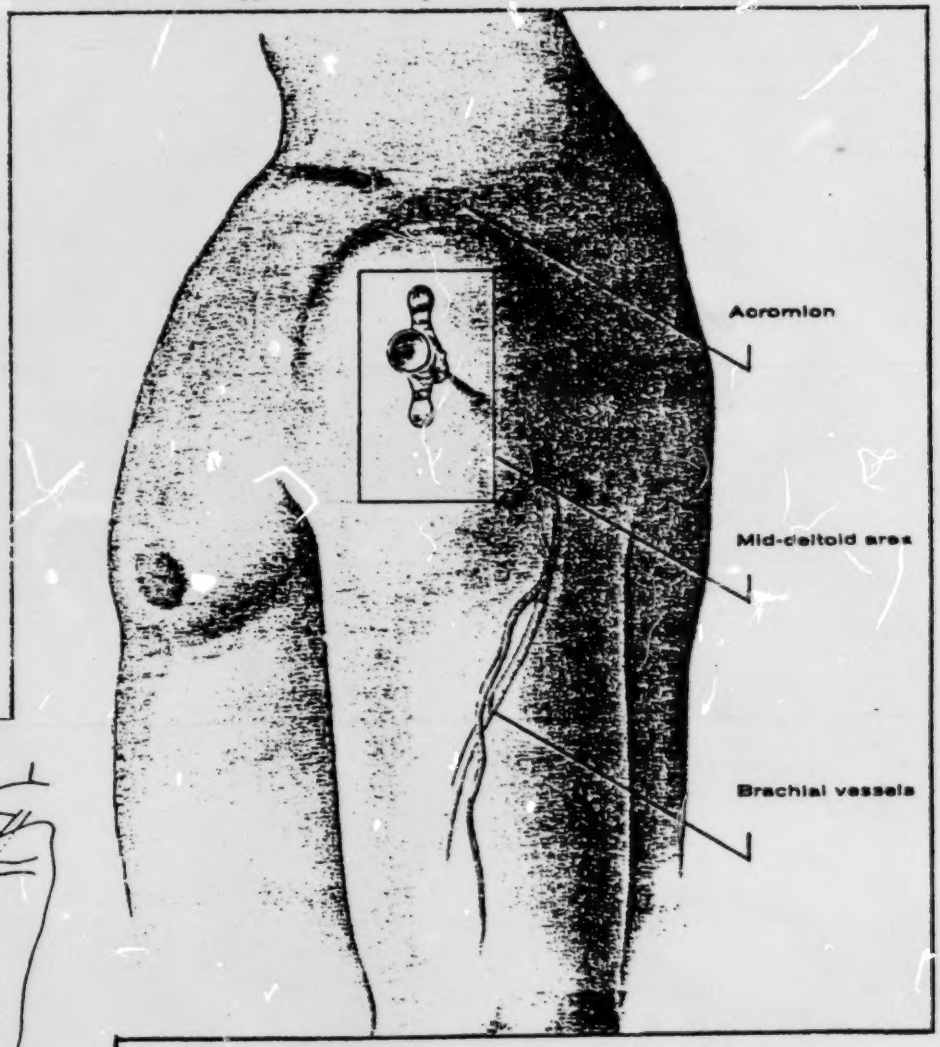
Feedback for Question 2A

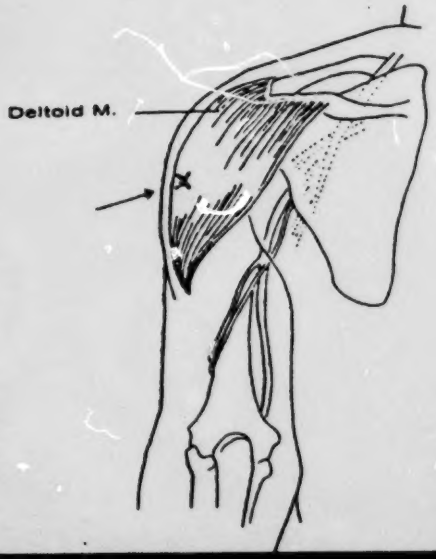
1" needle

Intramuscular injection sites / the Mid-Deltoid area

A site often chosen for its ease of access is the deltoid area which can be employed when the patient is in either a standing, sitting, or prone position. While the deltoid muscle forms a fairly large triangle on the shoulder prominence, the actual area available to a shoulder injection is limited, since there are major bones, blood vessels and nerves to be avoided. The recommended boundaries of the injection area form a rectangle bounded by the lower edge of the acromion on the top to a point on the lateral side of the arm opposite the axilla or armpit on the bottom. The two side boundaries are lines parallel to the arm one-third and two-thirds of the way around the outer lateral aspect of the arm.

Care should be taken to avoid not only the acromion, clavicle and humerus, but also the brachial veins and arteries and the radial nerve. It is recommended that the number and size of injections made at this site be limited. The area is small and cannot tolerate repeated injections and large quantities of medication.



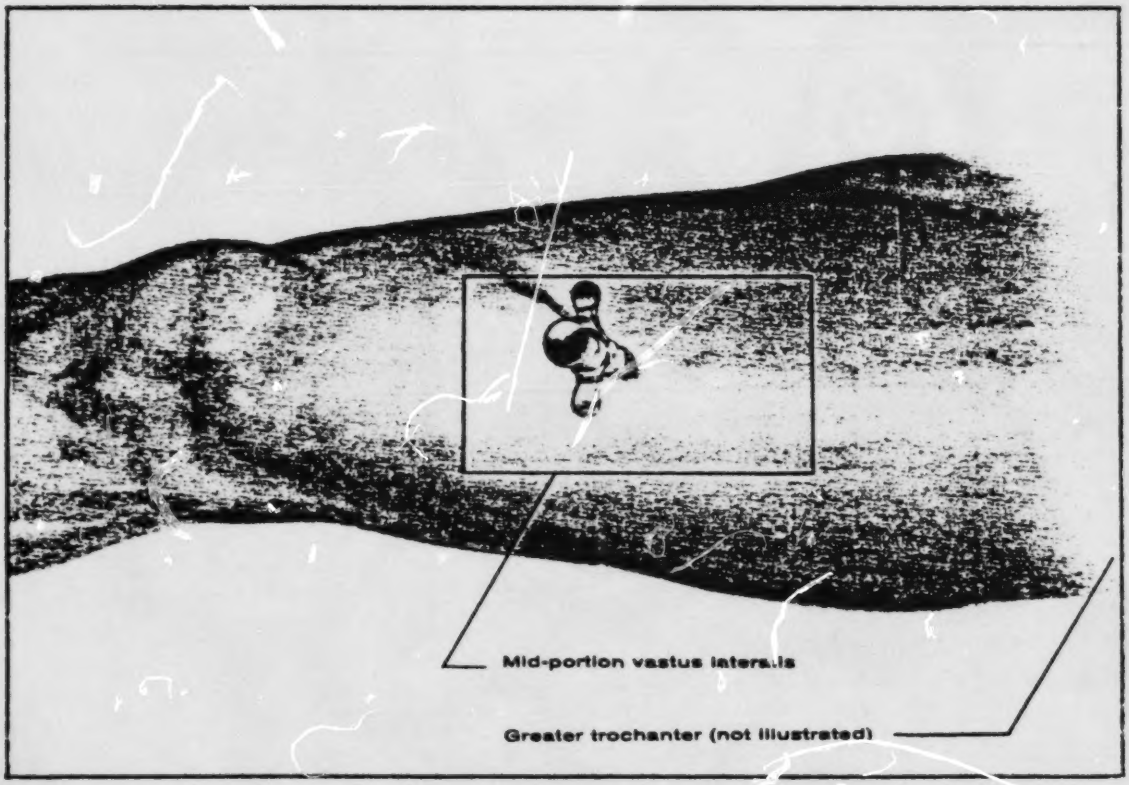


Illustrations courtesy of Wyeth Laboratories, Philadelphia, Pa.

Intramuscular injection sites / the Vastus Lateralis

Another site recommended for its relative safety and freedom from major nerves and blood vessels is the vastus lateralis. This injection area is bounded by the mid-anterior thigh on the front of the leg, the mid-lateral thigh on the side, a hand's breadth below the greater trochanter at the proximal end and another hand's breadth above the knee at the distal end.

Although it is easier to give an injection in the vastus lateralis when the patient is lying on his back, it is acceptable to use this site when he is in a sitting position. The entire area should be exposed to permit identification of anatomical landmarks pertinent to this site.



The needle length for the ventrogluteal and dorsogluteal area may be 1" to 1 1/2" length. The most commonly used is 1 1/2". The ventrogluteal area has less fat, no large nerves or blood vessels. The dorsogluteal site desired is about 2 to 3" below the crest of the ilium in the upper outer quadrants of the buttock.

Look at the pictures, if necessary, and compare the size of these muscles.

Practice Question 2B

Which needle length would be correct for an average adult in the dorsogluteal area?

Feedback for Question 2B

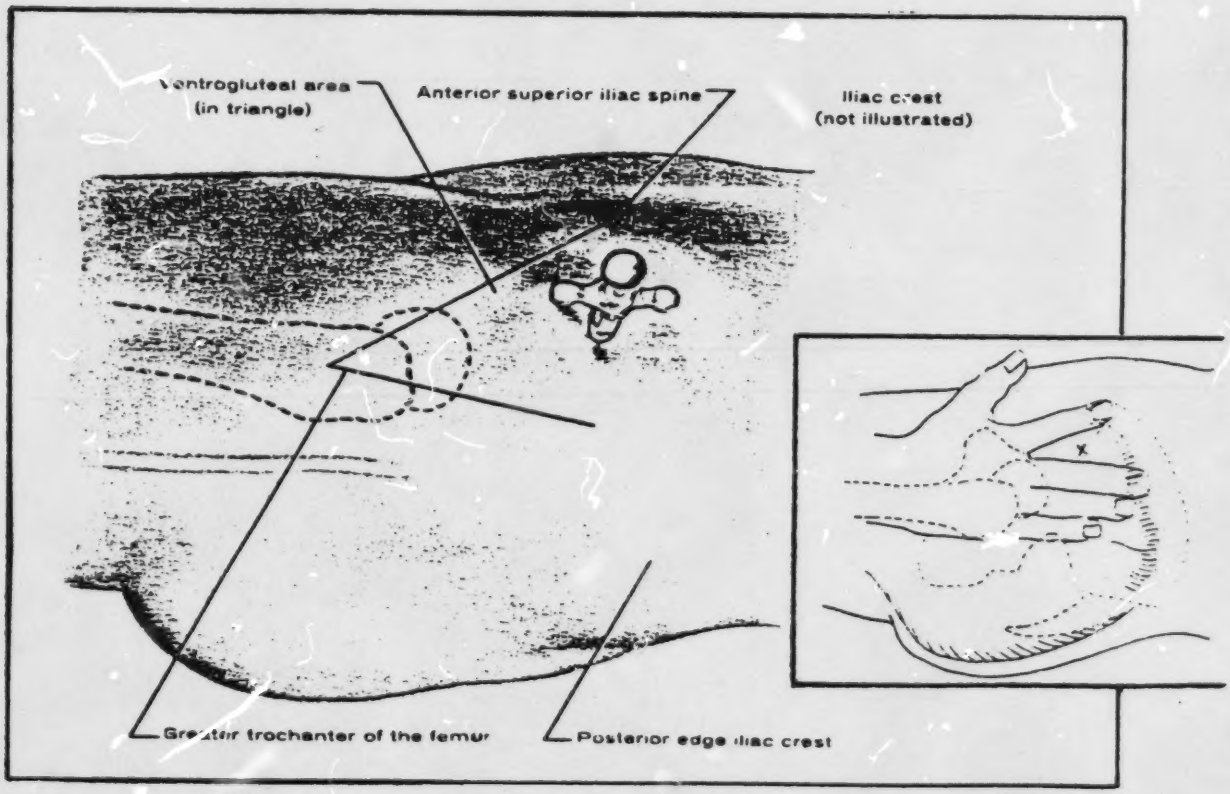
1 1/2" needle.

Intramuscular injection sites / the Ventrogluteal area

The ventrogluteal area (von Hochstetter's site) has been accorded growing recognition as a site removed from major nerves and vascular structures. The subcutaneous fatty layer is relatively shallow and there is good gluteal muscle density. Because anatomical landmarks are easily identifiable around the ventral area of the gluteal muscles, this site is also recommended for injections in children. Although especially suitable for a patient lying on his back, this site is also accessible with the patient lying prone, on his side, or standing.

The patient should always be sufficiently exposed to enable adequate identification of anatomical landmarks.

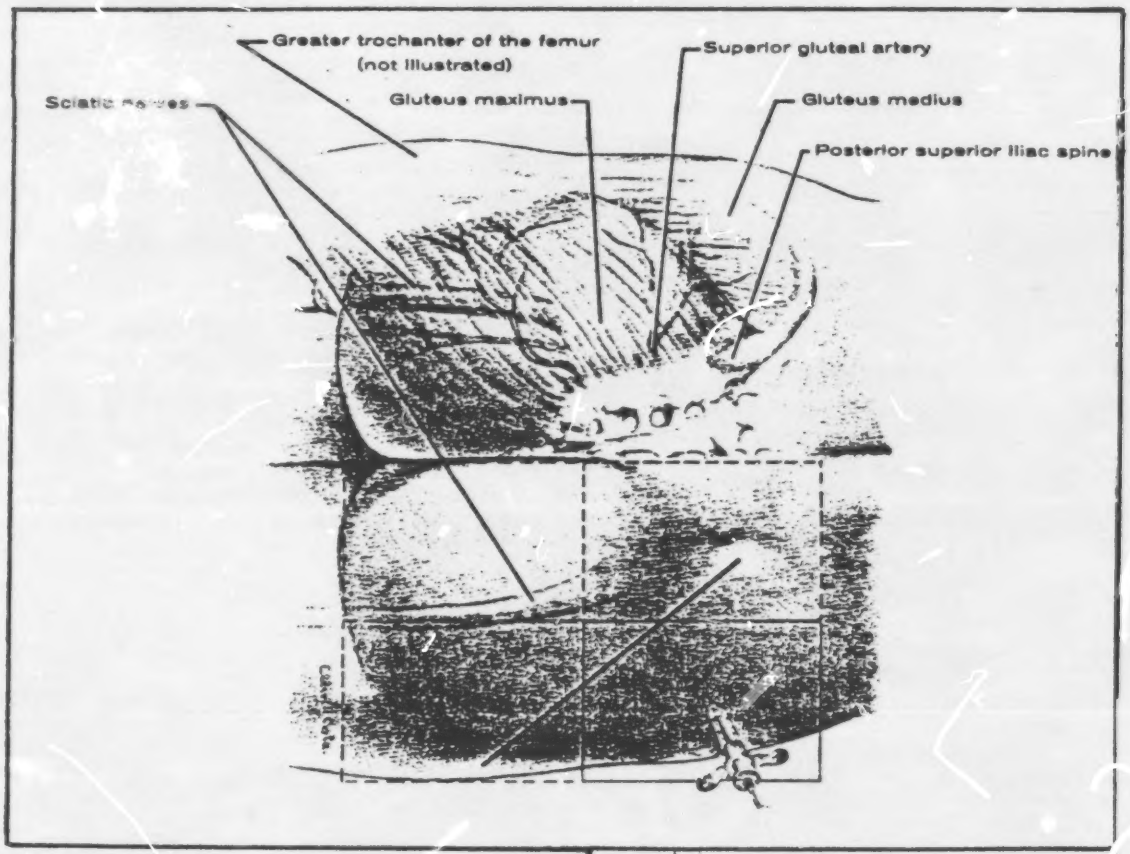
Palpate to find the greater trochanter, the anterior superior iliac spine and the iliac crest. When injecting into the left side of the patient, place the palm of the right hand on the greater trochanter and the index finger on the anterior superior iliac spine. (Use the left hand to delineate the site when injecting into the patient's right side.) Spread the middle finger posteriorly away from the index finger as far as possible along the iliac crest, as shown in the straight-line drawing below. A "V" space or triangle between the index and middle finger is formed. The injection is made in the center of the triangle with the needle directed slightly upward toward the crest of the ilium.

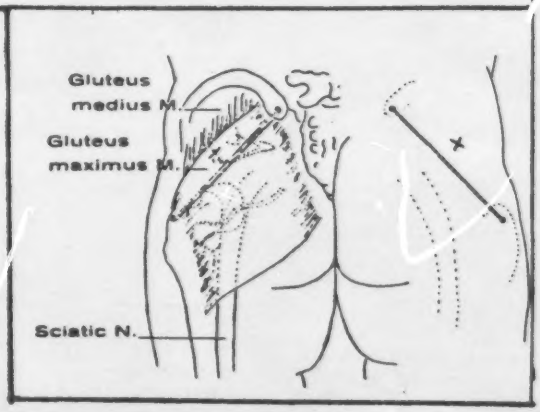


Intramuscular injection sites / the Gluteus Medius

Perhaps the most commonly considered site for injections is the posterior gluteal area. In defining this site for injection purposes care should be given to restrict injections to that portion of the gluteus medius which is above and outside of a diagonal line drawn from the greater trochanter of the femur to the posterior superior iliac spine. Extreme caution should be observed to ensure that the boundary line is maintained, avoiding the hazard of possibly injecting into either the sciatic nerve or the superior gluteal artery.

The patient should be lying face down. A "toe-in" position relaxes the muscles. The injection site should be clearly exposed. Under no circumstances should there be any compromise with correct technic. Do not hurry, do not let modesty tempt you to give this injection to a person who is bending over a table or with his clothing only partially removed from the injection site. The needle is inserted perpendicular to the flat surface on which the patient is lying—needle penetration should be on a direct back-to-front course.





PRACTICE EXERCISE #3

Input

The gauge needle selected depends on the viscosity of the solution. The needle length is determined by the muscle site and patient size. Review gauge and length of needles, solution viscosity, and diagrams of sites.

Practice Question #3

1) Select the appropriate needle for an oily solution to be given in the ventrogluteal area of an average adult.

2) Select the appropriate needle for an aqueous solution to be given in the vastus lateralis of a thin adult.

Feedback for Question #3

1) 19 gauge, 1½" needle

2) 23 gauge, 1 " needle

PRACTICE EXERCISE FOR OVERALL OBJECTIVE

Select the appropriate needle for the solution identified in each of the situations below. Prepare the 3 cc syringe with the desired volume from the available solutions and identify the best area for administration for each of the practice questions.

3 vials + 1 ampule	Needles - Gauge, Needle Length
#1	25, 5/8" needle
#2	23, 1" needle
#3	22, 1½" needle
Ampule	20, 1" needle
	19, 1½" needle

Situation #1: Mrs. T. J. is to receive 1 cc of the ampule (or vial #1). She is 5', 110 pounds, age 65 and she must remain on her back.

Situation #2: Mrs. A. B. is to receive 1.5 cc of Solution #3 vial. She is 5'5", 150 pounds, age 35 and ambulatory.

Situation #3: Miss I. T. is to receive 1.3 cc of Solution #2. She is 5'2", 115 pounds, age 23 and turns readily from side to side.

Feedback

Situation #1 - 23, 1" needle, vastus lateralis

Situation #2 - 19, 1 1/2" needle, dorsogluteal area

Situation #3 - 20, 1" needle, ventrogluteal area

PLEASE TAKE THE POST-TEST AND SCORE IT.

POST-TEST

1. Which guage needle has the largest diameter?
2. What needle lengths may be used for intramuscular injections?
3. Which gauge needles are used for aqueous, aqueous suspension, oily, and oily suspension solutions?
4. What are the lenghts of needles commonly used for the deltoid muscle?
5. What are the lengths of needles commonly used for the vastus lateralis muscle?
6. What are the lengths of needles commonly used for the dorsogluteal and ventrogluteal areas?

ANSWERS TO POST TEST

1. 19 gauge
2. 1 to 3 inches
3. Aqueous - 22 gauge

   Aqueous suspension - 20 gauge

   Oily - 20 or 19 gauge

   Oily suspension - 19 gauge
4. 1 to 1 1/2 inches, preferred length 1 inch
5. 1 to 1 1/2 inches, preferred length 1 inch
6. 1 1/2"

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PREPARATION OF AN INTRAMUSCULAR INJECTION FROM A DRUG IN POWDER FORM

by

Eva M. Meyer, R.N.

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TITLE OF PACKAGE:	Preparation of An Intramuscular Injection From A Drug in Powder Form
AUTHOR:	Eva M. Meyer
INSTITUTION:	Mesa Community College Mesa, Ariz.
INTENDED STUDENTS:	Nursing; pharmacology
ESTIMATED WORKING TIME:	30 minutes
MATERIALS NEEDED:	2 cc. syringe with 22 gauge, 1½" needle; 1 vial with powder; 1 vial with sterile saline solution; alcohol wipes; "Fundamentals of Nursing" by Fuerst, Wolff and Weitzel (Lippincott, 1974)

FIELD TEST COPY

Prerequisites for completion of this unit include knowledge of:

- -Sterile techniques for injections;
- -Computation problems in Pharmacology;
- -Abbreviations and Symbols used in Pharmacology.

A partner is needed to check the student's performance.

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OBJECTIVES OF UNIT

Overall Objective

The student will prepare an intramuscular injection from a drug in powder form.

Sub-Objectives

The student will:

1) Select the medicine as ordered by the doctor.
2) Select the syringe and needle, stating rationale for selection.
3) Using sterile technique, prepare the medicine for administration by following the directions on the label.

PRACTICE EXERCISE #1

Read: Fuerst, Wolff, and Weitzel, "Fundamentals of Nursing," pp.426-428

Medicines are packaged in a variety of ways. It is the nurse's responsibility to carefully check the doctor's order to determine if the medication sent for the patient is in the proper form. The nurse must not only determine correct dosage, but also the correct form. For example, the doctor orders Laquel 100 mg. I.M. daily Forms of the drug that are available may include:

Forms available	Rationale for using or not using
oral capsules (1 cap = Laquel 100 mg.)	could not be used for the patient because it is for oral use only.
ampules for I.V. use only (10 cc. = Laquel 16 m.)	could not be used for the patient because it is for I.V. use only
Tubex for I.M. use only (1 cc. = Laquel 10 mg.)	is for I.M. use but in order to give the ordered dose, the nurse would have to administer 10 cc. and use 10 Tubex.
vial containing a white powder and labeled Laquel 0.1 Gm. for I.M. or I.V. use. To reconstitute, add sterile saline solution.	is for I.M. use and contains the correct dose.

Practice Question #1

1) The doctor orders Niap gr. X I.M. q. H.S.
Which one of the following contains the correct medication?

A.	a Tubex labeled:	Niap 300 mg./1.0 cc. For I.M. use only.
B.	a screw cap bottle labeled:	Niap 5cc./0.05 Gm. For oral use only.
C.	A glass ampule labeled:	Niap gr. x for I.V. use only 50 cc.
D.	A vial containing a white powder labeled:	Niap 600 Mg. Add sterile physiologic solution to reconstitute For I.M. or I.V. use.

Feedback-

A. Wrong - Tubex contains only ½ the ordered dose. If you chose to use the Tubex, you would have to give two injections for the desired dose.

B. Wrong - this is for oral use only (also 66 cc = gr.X)

C. Wrong - this is for I.V. use only (also 50 cc = gr.X)

D. Right! If you chose this, you are doing very well.

PRACTICE EXERCISE #2

When preparing an intramuscular injection, a needle should be selected which has a large enough lumen for thicker preparations and which is long enough to reach muscle tissue. If the lumen is too small, the solution may be difficult or impossible to give. If the needle is too short, the injection will be given subcutaneously and tissue damage may result. If the needle is too long, damage to the bone may occur. A 22 gauge, 1 ½" needle is used for the average adult when giving thin aqueous solutions. Usually not more than 2½ to 3 cc. is given in a single injection so a 3 cc. syringe is most often used.

Practice Question #2

You are to give a 2 cc. intramuscular injection that is in a thin aqueous solution. The patient is a 25-year-old female who is 5 foot, 8 inches tall and weighs 135 lbs. You should select which of the following?

a) a 3 cc. syringe and 25 gauge, ½" needle.

b) a 5 cc. syringe and 22 gauge, 1½" needle.

c) a 3 cc. syringe and 22 gauge, 1½" needle.

d) a 5 cc. syringe and 19 gauge, 2" needle.

Feedback

a) Wrong. Syringe is correct size, but needle is too small.

b) Wrong. Syringe is too large and needle is correct size.

c) Right ON!!

d) Wrong. Both syringe and needle are too large.

PRACTICE EXERCISE #3

(This material is adapted from: "Pharmacology and Medications" by Eloise Worley, pp. 67-69.)

The medicine you had in powder form must be liquified. You will need to use a two-step procedure. First, draw up the amount of sterile saline solution, according to the directions on the label. Then, add that amount to the powder. Allow powder to dissolve and withdraw medicine.

Practice the following:

a) Read the doctor's order:

Niap gr. X I.M. q. H.S.

b) Obtain the proper equipment and the correct drug.

c) Read directions on label.

d) Cleanse stoppers of both vials with an alcohol sponge.

e) Draw air into the syringe equal to the amount of solution to be withdrawn.

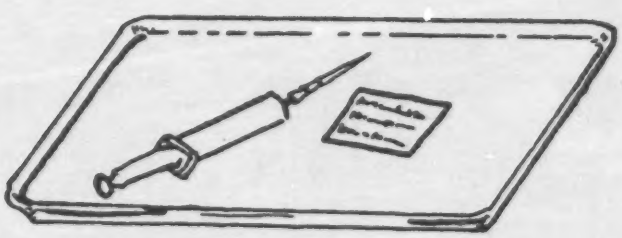
f) Inject this air into vial of normal saline. Do not invert the vial.

g) Invert the vial and draw the desired amount of solution into the syringe. (2 cc.)

h) Remove needle from the vial. Inject saline solution into vial of medicine. Do not invert the vial.

i) Allow powder to dissolve. Invert the vial and draw the contents of the vial into the syringe.

j) Remove the needle from the vial and replace sterile needle cover.



Practice Question #3

1) Briefly, what are the two steps to the procedure for liquifying a drug in powder form?

2) Did you complete the practice a) through j) to the point that you feel confident with the procedure?

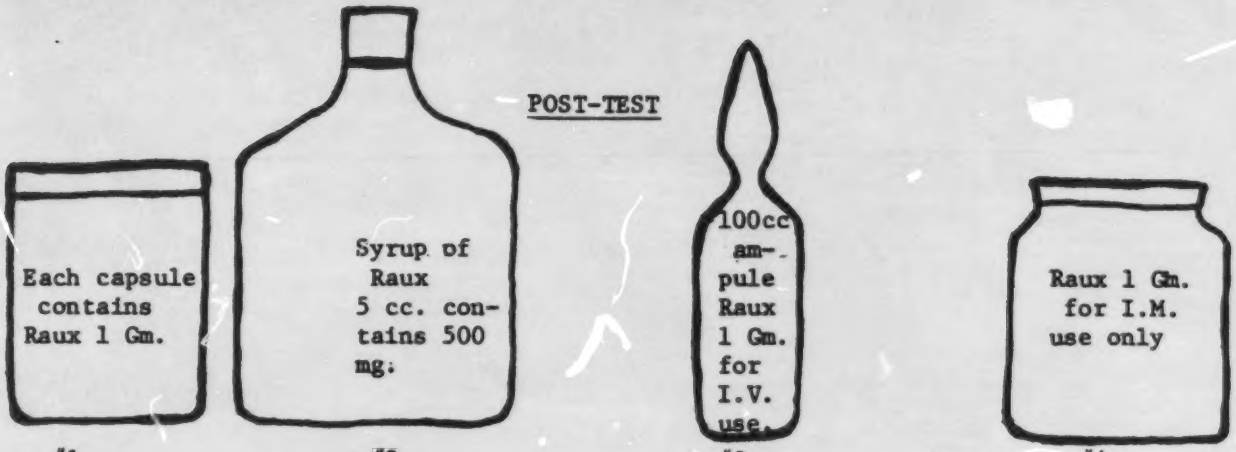
_____Yes _____No

Feedback

1) Draw up the amount of sterile saline solution according to directions on the label and add that amount to the power. Allow powder to dissolve and withdraw medicine.

2) If your answer was YES, you are ready to turn the page and take the Post-Test; if NO, you should take a few minutes to backtrack and review the a) through j) sequence.

POST-TEST


Each capsule contains Raux 1 Gm.
Syrup of Raux 5 cc. contains 500 mg.
100cc ampule Raux 1 Gm. for I.V. use.
Raux 1 Gm. for I.M. use only
#1
#2
#3
#4

1) The doctor has ordered Raux 1 Gm. I.M. daily.

Which of the above contains the correct medicine?

A. 1

B. 2

C. 3

D. 4

2) When giving an intramuscular injection to an adult, the needle most likely to be used would be:

A. 22 gauge, ½ inch

B. 22 gauge, 1½ inch

C. 25 gauge, ½ inch

D. 19 gauge, 2 inch

3) The doctor orders Raux 0.5 Gm. I.M. daily. The medicine comes in a vial in powder form. The label states: Raux 0.5 Gm., to reconstitute add sterile saline solution. To prepare the medicine, you would:

A. Add 2 cc. of sterile saline solution and draw up 1 cc. of the medicine.

B. Add 1 cc. of sterile solution to 2 vials and draw up contents of both vials.

C. Add 2 cc of sterile saline solution and draw up 2 cc. of the medicine.

D. Add 1 cc. of sterile saline solution and draw up ½ cc of the medicine.

4) The doctor orders Raux 1 Gm. I.M. To ensure sterility of the medicine, you would:

A. Use sterile saline solution or water to reconstitute medicine in powder form.

B. Cleanse the top of the vial with alcohol before inserting the needle.

C. Wear a mask when preparing the injection.

D. Handle the shaft of the plunger carefully.

1. C & D
2. A, B, & D
3. A & B
4. B only

5) Prepare an intramuscular injection from a medicine in powder form. Have another student observe you and fill in the check sheet portion of the Answer Sheet.

POST-TEST ANSWER KEY

1. D

2. B

3. C

4. 3 (A & B)

5. If you checked out correctly on all 12 steps, you have fulfilled our objectives; if not, you may want to review.

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INTRAMUSCULAR INJECTION TECHNIQUE: GLUTEAL AREA

by

Marcia McCormick

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TITLE OF PACKAGE:	Intramuscular Injection Technique: Gluteal Area
AUTHOR:	Marcia McCormick
INSTITUTION:	Rio Hondo College, Whittier, CA
INTENDED STUDENTS:	Nursing
ESTIMATED WORKING TIME:	30 Minutes
MATERIALS NEEDED:	Water-filled Tubex syringe with needle; alcohol swab; chalk; hip model or spongy rubber ball.
REVISED:	Nov. 15, 1977

NOTE: Effective use of this unit requires that materials listed above be available to student. Interaction with another student is recommended for the post-test.

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OBJECTIVES OF UNIT

Overall Objective

The student will be able to inject a measured amount of medication into the gluteal area of a simulated hip, using aseptic technique.

Sub-Objectives

1. Identify by palpation two landmarks to use when selecting a safe site for injection into the gluteal area.
2. Identify the two structures that should be avoided when injecting medication into the hip.
3. Select a site for injection of an I.M. medication that lies above an imaginary line drawn between the two landmarks palpated.
4. Demonstrate the ability to inject a medication into the simulated hip, including the steps included in this unit.
5. Aspirate to check for possibility of insertion into a blood vessel, and recognize the necessity for relocating the injection site if blood appears in the syringe.

ATTITUDINAL OBJECTIVES

1. Students will state that they believe they could administer an I.M. injection to a patient.
2. Students express an eagerness to use the technique learned on "real" patients.

INTRODUCTION

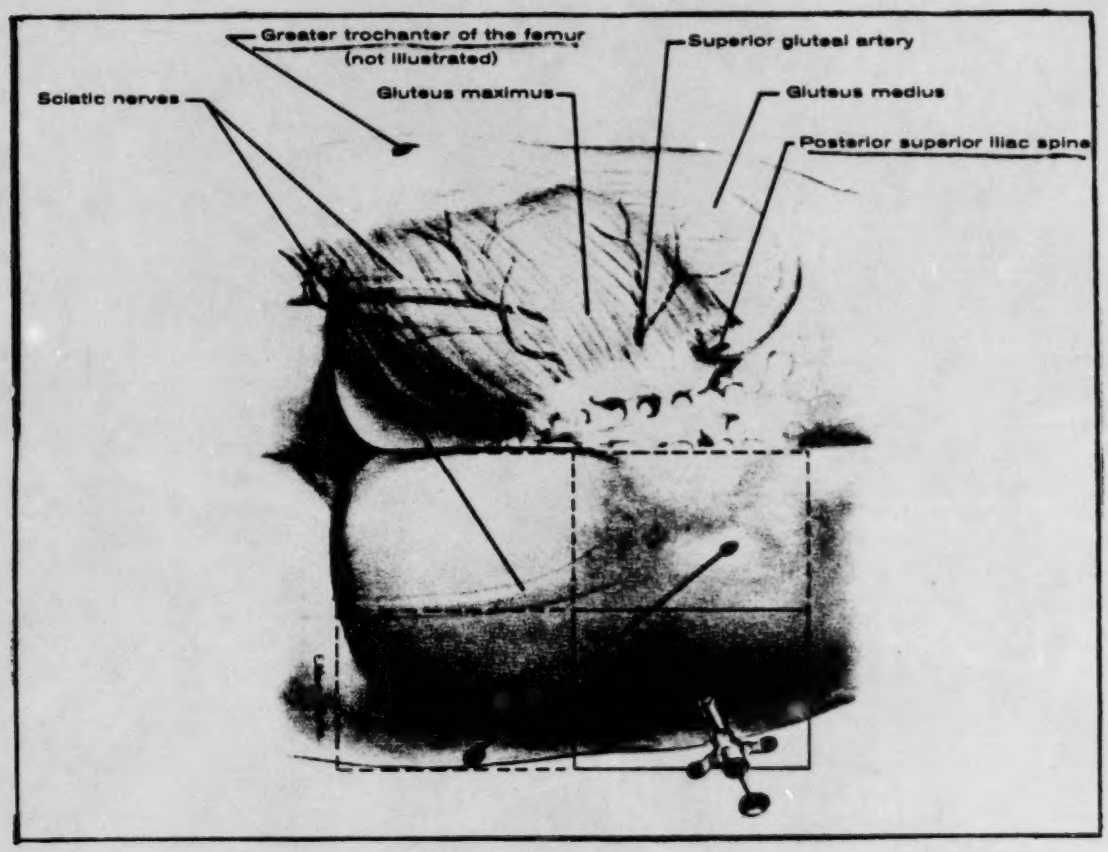
This unit will assist you to administer an intramuscular injection into a simulated hip, and will prepare you to administer one to a patient.

You will be expected to maintain aseptic technique throughout this procedure, so utilize the actions you learned in the previous sequence when handling the equipment.

Before you begin, place the two diagrams out on the table, since you will need to refer to them frequently.

Now you are ready to turn to the Practice Exercise No. 1 and continue to follow the sequence.

Diagram No. 1



- Body landmarks

Diagrams courtesy of Wyeth Laboratories, Philadelphia, Pa.

Giving the intramuscular injection

CLEANSE SITE

1. Using an alcohol sponge or swab, cleanse an area approximately two inches square around the proposed injection site.

SPREAD SKIN

2. With the index and thumb of the left hand spread or tense the skin in the injection area.

INSERT NEEDLE

3. Holding the barrel of the syringe in the right hand in a dart or pencil grip, introc the needle into the skin with a quick thrus and at a right angle to the skin.

CONTINUE INSERTION

4. Once the surface of the skin has been punctured by the needle, the remainder of the penetration of the needle through the skin and into the muscle should be with a firm and steady pressure.

ASPIRATE

5. Once the desired depth of insertion has been reached, steady the syringe tip with the left hand and with the right hand pull back or out on the plunger approximately one-quarter inch for a few seconds, to see if any blood can be aspirated back into the syringe. Should blood appear in the syringe, the needle should be withdrawn and a new injection site selected.

INJECT MEDICATION

6. If no blood appears, the position of the fingers on the right hand can be shifted so that the thumb covers the head of the plunger and the index and middle fingers are hooked under the side grips on the syringe barrel. With a firm pressure on the thumb move the plunger downward into the syringe as far as it will go.

REMOVE NEEDLE

7. After the medication has been injected, apply pressure against the injection site with the alcohol sponge in the left hand as the needle is withdrawn by the right hand; this reduces the risk of medication leaking into the subcutaneous tissues and possibly forming abscesses.

Practice Exercise No. 1

Input

Site selection is an important aspect of injection technique. In adults the recommended site of intramuscular injection is the upper outer quadrant of the gluteal area.

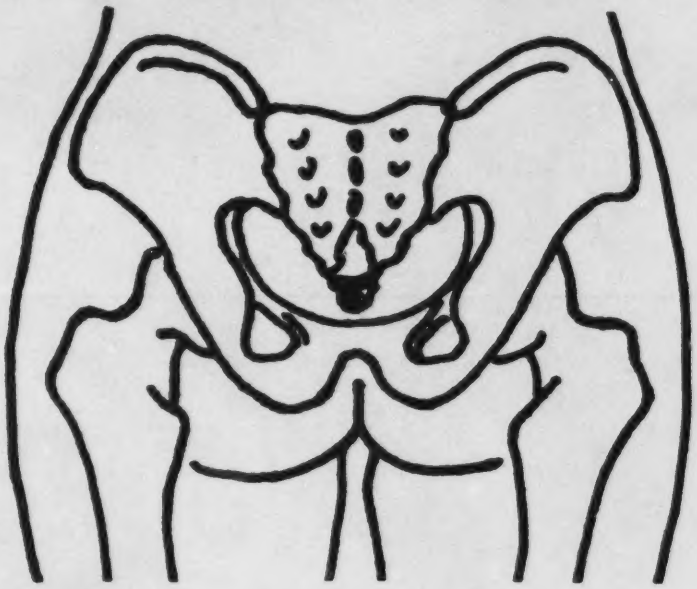
Care should be taken to restrict injections to that portion of the gluteus that is above and outside of an imaginary diagonal line drawn from two bony landmarks. These landmarks are the greater trochanter of the femur, and the posterior superior iliac spine. Any injection located lateral and superior to this line will be well within the region of the greatest gluteal mass.

It is important to establish landmarks by palpation (feeling with the hand) rather than by visual identification, since there may be normal variations in anatomic structures that are not visible.

Study diagram No. 1 and locate the two bony landmarks. Now you are ready to locate these landmarks on the hip model. Try to identify these landmarks on the hip. If you are not sure of the proper location of these two bony prominences, you may turn the hip over and inspect the bony skeleton.

Practice Question No. 1

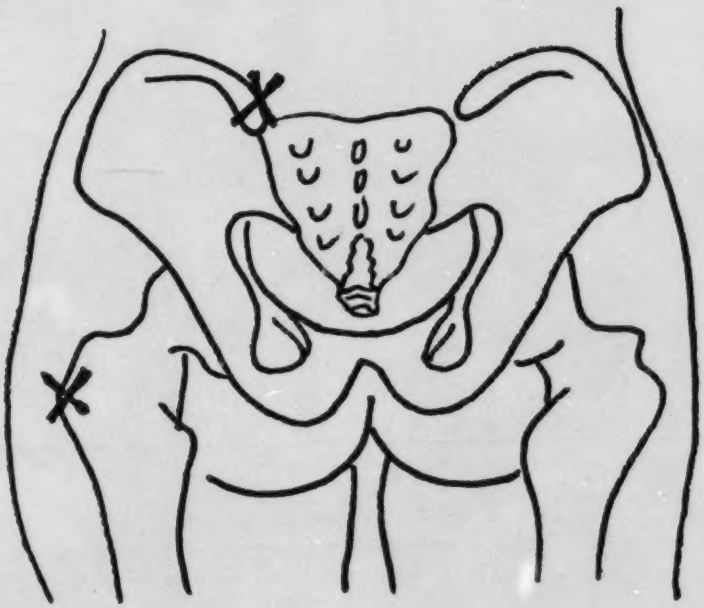
Place an "x" over each of the two bony landmarks on the diagram below:



Feedback

Turn this page and check your answer.

Feedback



Practice Exercise No. 2

Input

Caution should be observed to avoid the hazard of possibly injecting into either the sciatic nerve or the superior gluteal artery.

Study diagram No. 1 again, to identify the location of the sciatic nerve and the superior gluteal artery.

Practice Question No. 2

List the two structures that must be avoided when injecting medication into the gluteal area.

_____

_____

Turn this page and check your answer.

Answer to Practice Question No. 2

Sciatic Nerve

Superior gluteal artery (blood vessel is satisfactory answer)

Practice Exercise No. 3

Input

Study diagram No. 1 again and identify the site selected for injection. Locate this site on your anatomical hip model.

Remember, any injection located lateral and superior to a line drawn between the two bony landmarks will be safe.

Practice Question No. 3

Using the anatomical model, identify a safe site for injection of an intramuscular medication, by placing a chalk mark at that site. You will find a piece of chalk in your activity box.

Feedback

Check your accuracy by comparing the "x" you placed on the anatomical model with the site indicated on diagram No. 1.

Practice Exercise No.4

Input

Now that you can locate a safe site, you are ready to learn how to give an intramuscular injection.

Study diagram No. 2, viewing each picture in sequence, 1-7, studying each frame at least twice. When you are ready to view the sequence a third time, open your activity box and locate the Tubex syringe with needle and alcohol swab.

Practice

Follow each step illustrated in diagram No. 2, using the equipment provided. You will probably want to repeat the procedure at least three times. (You may instill the water from the pre-filled syringe into the hip model.)

Practice Question No. 4

1) List the seven steps

2) Ask another student to observe you give the I.M. injection to the hip model. The other student should follow the sequence in diagram No. 2 as you proceed.

Feedback

1) Check your list with Diagram 2

2) The other student will validate that you gave the I.M. correctly.

If you are having difficulty, you should practice again, before seeking another validation.

Now you are ready to administer an intramuscular injection to a patient under the supervision of your instructor.

Practice Exercise No. 5

Input

It is very important that you remember to aspirate before injecting medication intramuscularly. Some drugs are not suitable for injection into a blood vessel and more rapid effect may be produced than that which is desired. Remember that should blood appear in the syringe, the needle should be withdrawn. Discard the contaminated medication and start anew with a new site.

Practice Question No. 5

1) State the reason it is necessary to aspirate before injecting the medication.

2) What is the proper response of the nurse, should blood appear in the syringe when aspirating?

Answer to Practice Question No. 5

1) Determine that needle is not located in a blood vessel.

2) Withdraw the needle, discard the contaminated medication, and start anew with a new site.

Post Test

1. The two anatomical landmarks that should be palpated when selecting an I.M. gluteal injection site are:

   _____ _____

2. There are two structures that must be avoided when injecting medication into the gluteal area. List the two structures.

   _____ _____

3. Use the drawing below to identify a safe area for administering an I.M. injection. Draw a diagonal line between the two landmarks and place an "x" at the site you would select.

4. Ask another student to observe you administer the I.M. injection to the hip model. Direct the student to follow the diagram No. 2 as you do the procedure to validate your accuracy.

5. The aspiration step is necessary to determine _____.

   If blood appears in the syringe during aspiration, you must

   _____

KEY TO POST TEST

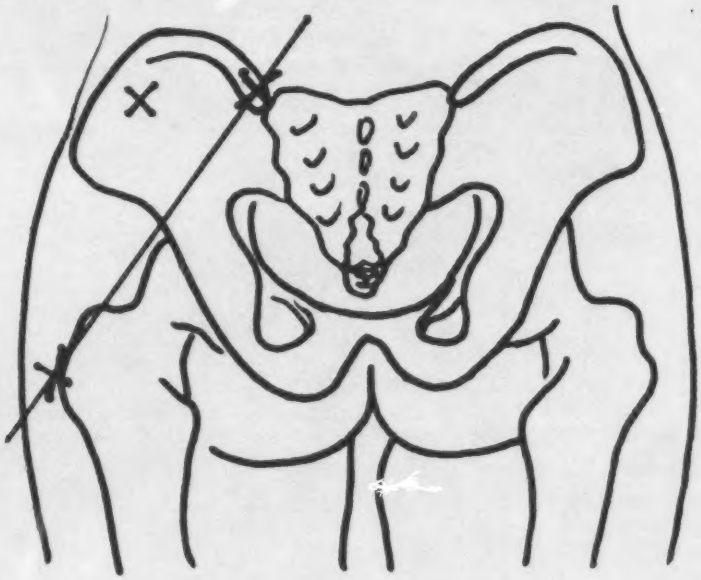
1. Posterior superior iliac spine

   Greater trochanter of femur

2. Sciatic nerve (nerve is satisfactory answer)

   Blood vessel

3.



4. Validation by another student that you gave the I.M. correctly.
5. Withdraw the needle. Discard the contaminated medication and start over with a new site.

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A PROJECT OF THE LEAGUE FOR INNOVATION IN THE COMMUNITY COLLEGE

Injection of Insulin

By

Kathleen Mitzen

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TITLE:	Injection of Insulin
AUTHOR:	Kathleen Mitzen
INSTITUTION:	Rio Hondo College, Whittier, CA.
INTENDED STUDENTS:	Nursing
ESTIMATED WORKING TIME:	30 minutes
MATERIALS:	Alcohol wipe; syringe with sheathed needle

FIELD TEST COPY

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Introduction

Insulin injection! How is it given? How is the skin protected? Where is it given safely? Can I learn to give it efficiently and then teach my patient?

All these questions arise in every medical facility and on every service. In this program, basic insulin injection is explained. Use a partner for best results. Review the types of insulin and filling the syringe if needed. Now, get started!

Overall Objective

Describe the proper sites and technique for insulin injection.

Sub-Objectives

1. Identify on a line drawing of the body the correct insulin injection sites.
2. Describe the method of preparing the skin for injection.

With another student:

3. Describe and perform the technique for pinching the skin and finding the injection site.
4. Describe the criteria for determining the correct angle of injection.
5. With another student, describe and perform the technique for injecting medication into the site up to the point of penetration.
6. Express confidence in administering insulin to a patient in the clinical area with the supervision of the instructor.

PRACTICE EXERCISE #1

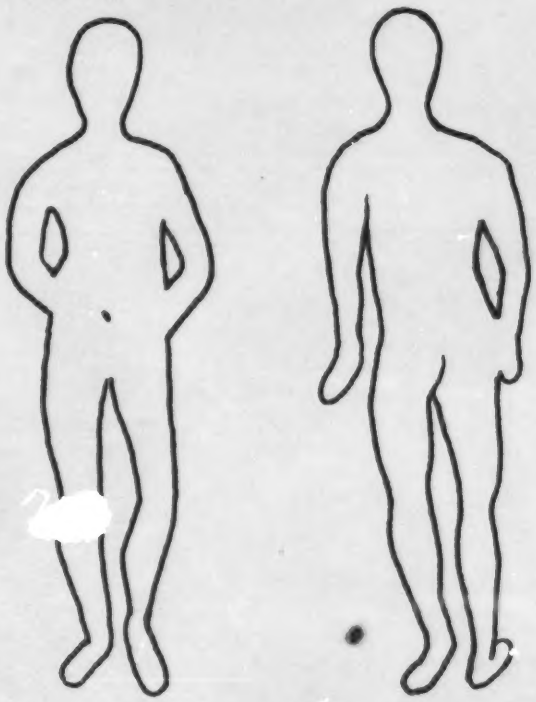
One term thrown around a lot in diabetic education is finding and rotating sites. What does this mean to you and your patient?

The duration of action is dependent on insulin being absorbed by the subcutaneous tissue, so site selection is critical. We use the deltoid area a hands breadth below the shoulder and above the elbows, the abdomen around the umbilicus and above the iliac crest, the anterior-laterial thighs a hands breadth below the fold of the groin, above the knee from anterior midline to lateral midline, and the buttocks. The abdominal area below the ribs down to the iliac crest, from lateral midline to within one inch of midline and within one inch of umbilicus is also used. In small children, the area over the scapula may be used but is not usually needed for the adult or older child. A good rule of thumb is that injections should be given one inch apart or two finger widths away from the previous injection site.

Turn the page and study these areas on diagram (page 4). The next important concept is changing the sites. No spot should be used more than once every two months, so you'll need to work out a plan with your patient. A map for such a plan is shown on page 5. Study page 5 before answering Practice Question #1.

Practice Question #1

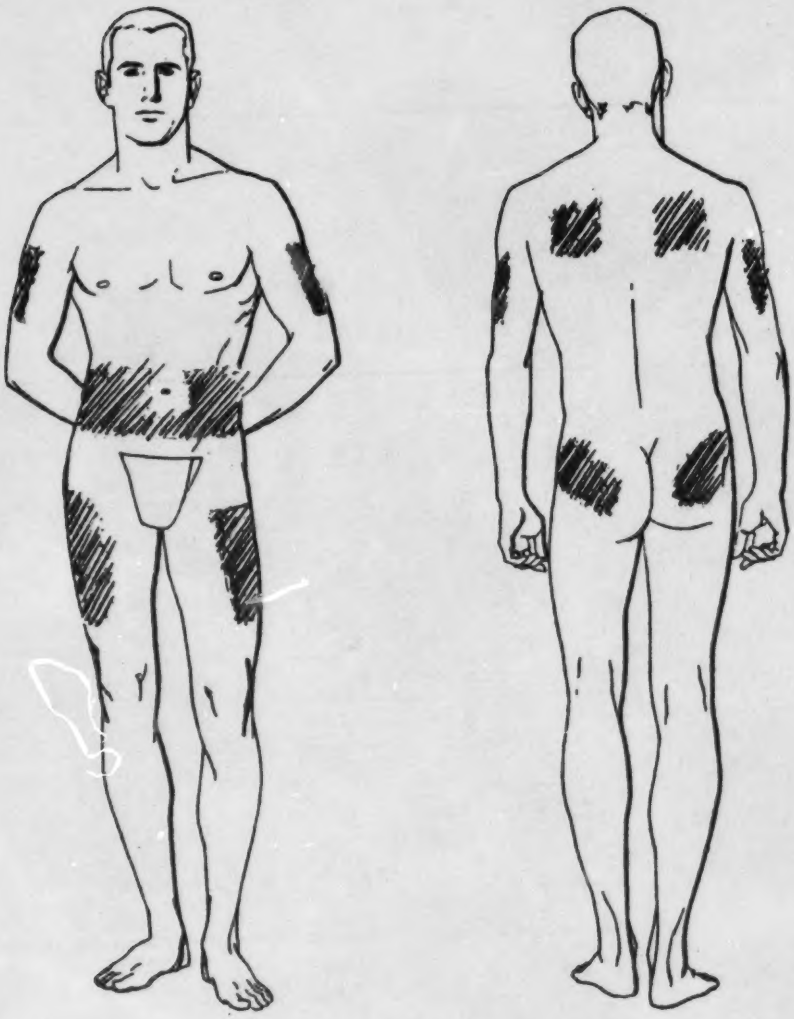
Shade in the diagrams with the correct areas for injection. (Take another look at diagram #1 if your memory needs refreshing.)

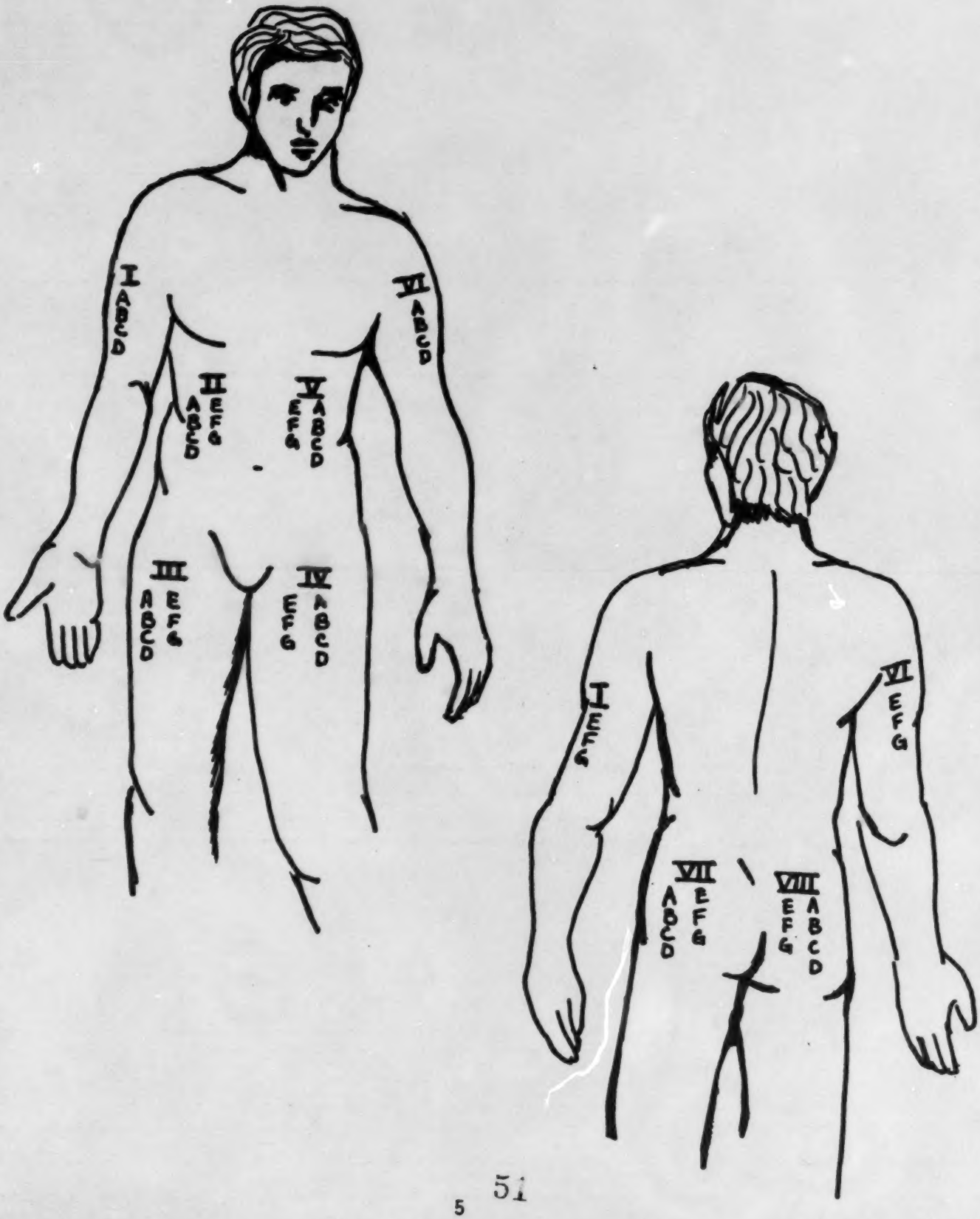


Turn to page 6 for correct answers.

Diagram1

sites of Insulin injections –change daily




I ABCD
II ABCD
II EFG
III ABCD
III EFG
IV ABCD
IV EFG
I ABCD
I EFG
VI EFG
VII ABCD
VII EFG
VIII ABCD
VIII EFG

Feedback

If you filled in the lateral deltoid area on the arm, the lower abdomen around the unbilicus and above the iliac crest, the anterior lateral thighs and the buttocks, great! You were right! Now that you know where you will put the injection, let's go on and see how to actually do it. Don't forget to change sites daily. Help your patient make up his own plan.

PRACTICE EXERCISE #2

Okay, you're now ready to do your duty and administer insulin. Remember to verify the order, draw up the proper insulin, check the dosage with another RN or LVN, and take an Alcowipe and medication to the patient's room. Also, identify the patient.

You would find the site using the methods we discussed previously and make sure the site has been rotated. You would clean the site with alcohol and let dry. Cleaning before the injection cuts down on surface soil and letting it dry makes your patients much happier because the alcohol does not sting when the injection is made.

Practice Question #2

As the medicine nurse, you are going to administer Mrs. K's insulin. You find the appropriate site. How do you prepare the site for injection?

Feedback

That's right! Clean the skin with alcohol and let dry. This cleans and prevents stinging from the alcohol.

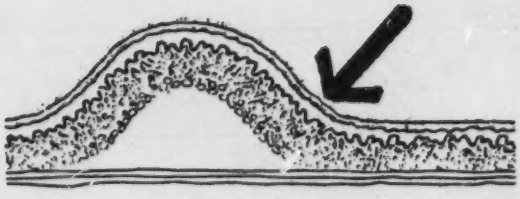
PRACTICE EXERCISE #3

Now for the part that takes your finesse and practice. You have found and prepared the site and are ready to give the injection. It has been found that there is good absorption and less tissue damage when the injection is given into subcutaneous tissue. The injection is given through the skin and subcutaneous layers and not deep enough to penetrate muscle.

If you lift the subcutaneous tissue, you find a hollowed area where the insulin can spread out over the muscle and be rapidly absorbed. See the illustrations below. These show the lift of the subcutaneous layers and the hollow you will feel for. To identify this site, you would place your finger at the point shown in the figure by the arrow and feel the soft hollow area.

To lift the subcutaneous tissue away from the muscle, you will grasp the spot where you will give the injeciton between the thumb and fingers of your free hand. You will pinch the skin and fat up firmly away from the muscle.

Diagram 2



Practice Question #3

Using your partner as a model, practice finding a site on the deltoid, lift the subcutaneous tissue and find the actual site of the injection.

Feedback

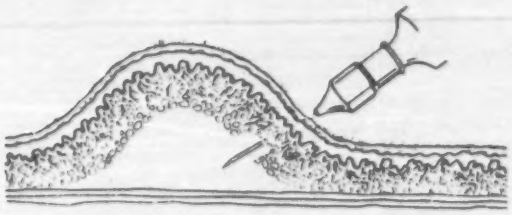
Depending on your partner's arm, you may have found this process easy or difficult. You should feel the tissue lift away from the muscle and feel a hollow or soft area under the pinch. You should also have positive feedback from your "patient".

The pinch should be firm but not really hurt and you don't want the "patient" to sport a bruise after your handwork.

PRACTICE EXERCISE #4

The actual procedure for injection will be described in the next section. Insulin is injected into the soft spot or hollow area so we need to discuss the angle of injection next. Along with everything else in life, we have rules and exceptions for the angle of injection of insulin into the hollow space. For most people the pinch of skin is lifted away from the muscle and a definite hollow is felt. A 45^{0} angle is used as shown in the accompanying diagram 3. Our exception is if the patient is very fat or has very firm subcutaneous layers, you may have difficulty lifting and may need to increase the angle into the hollow area that you do feel. You should still feel for a soft spot and give the injection under the pinch.

Diagram 3



Practice Question #4

Using your "practice patient" determine the angle you will use to give the insulin injection. Describe the criteria on your paper.

Turn page for correct answer

Feedback

You and your partner should check each other in determining the correct angle of injection. If the hollow is easily identified, a 45^{0} angle is used. If the tissue is difficult to lift and the soft area is difficult to identify, the angle may be increased to $60\text{-}80^{0}$ to insure the injection of the medication subcutaneously.

PRACTICE EXERCISE #5

Since you have identified your site and decided upon an angle of injection in actual practice, you would be ready to proceed with the injection. The correct procedure is to lift the tissue and find the site. Hold the syringe like a pencil, then inject the medication with a quick thrust of the needle at the angle you determined is correct. Diabetics tend to have very tough skin so don't be dainty! A quick thrust should be less painful. It helps, too, to warn your patients the injection is coming. You don't want them to jerk away from the needle. As soon as the needle is in place, release the pinch and using these fingers, support the needle hub. Aspirate for blood to prevent injection of insulin into a blood vessel. Inject the insulin slowly if no blood is aspirated. If blood is aspirated, withdraw the needle. If large amount of blood is aspirated, you will have to draw up a new dose in a new syringe. If only a small amount of blood has been aspirated, it is only necessary to change the site of injection. After all the insulin is injected, withdraw the needle and wipe th site gently with alcohol. Do not rub.

Practice Question #5

Using your"practice patient" simulate the injection of the insulin into the site you identified. Keep the sheath on the needle. Practice until you feel coordinated with the equipment, and briefly list the steps in the procedure on your paper.

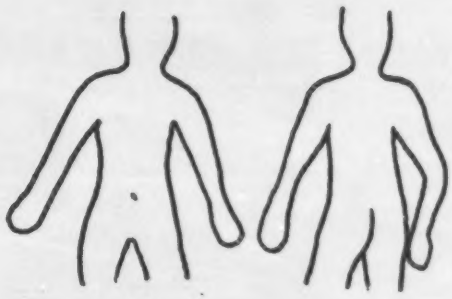
Feedback

Okay, how coordinated did you feel? Did you use a quick thrust, inject into the hollow, then let go of the pinch? The next correct steps are to steady the needle hub and aspirate for blood. Inject the insulin slowly, withdraw the needle, and wipe the site gently.

You are now ready to take the written post test and actually give an insulin injection in the clinical area with the guidance of your instructor.

POST-TEST

1. On the outline of the body, shade in the proper injection sites for administration of insulin.



2. Describe the preparation of the skin for injection.

3. Describe the procedure for pinching the skin for injection and finding the injection site.

4. Name the layers of tissue the injection is given through. What layer of tissue do you want to avoid?

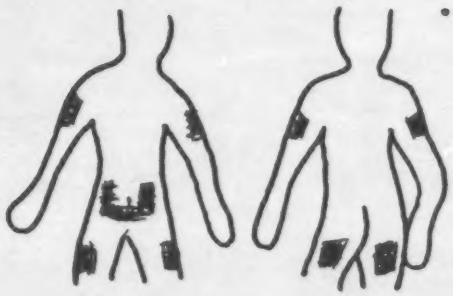
5. What criteria is used to determine the angle of injection of the needle?

6. List the steps of injection after the skin is lifted and the site is identified.

7. Do you now feel that you could give an insulin injection with the help of your instructor?

ANSWERS TO POST-TEST

(6 pts.) 1.



(2 pts.) 2. Clean skin with Alcowipe and let dry.

(4 pts.) 3. a. Lift the skin and subcutaneous tissue between thumb and first finger.
b. Feel for hollow area under the pinch. This is the injection site.

(2 pts.) 4. The injection is given through the skin and subcutaneous layers and not deep enough to penetrate muscle.

(4 pts.) 5. If the tissue is easily lifted and a definite hollow area is identified, the injection is made at a 45 degree angle.

If the tissue is very firm and it is difficult to lift and identify the hollow area, increase the angle to 60-80 degrees and inject under the pinch.

(6 pts.) 6. a. Inject needle at appropriate angle

b. Release pinch and support the needle hub

c. Aspirate for blood

d. If no blood returns, inject insulin slowly

e. Withdraw needle

f. Wipe the site with an Alcowipe. Do not rub.

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